

## REMARKS

Claims 1-6 are pending in this application. Claim 1 has been amended to indicate that the connective tissue construct is grafted "to close" the opening in the annular fibrosis. This amendment has been made to better define the claimed invention and is not believed to be a narrowing amendment. Support for this amendment can be found in original claim 1. Claim 6 has been amended herein to specify that the cultured connective tissue is a construct and that the surgical repair is of an intervertebral disc. Support for these amendments can be found, *inter alia*, in original claim 1. Claims 2 and 6 have been amended to correct inadvertent typographical errors. Accordingly, no new matter has been added by these amendments.

Claim 7 has been added herein. Support for this new claim can be found, *inter alia*, in original claim 1. Accordingly, no new matter has been added by this claim.

Therefore, after entry of these amendments, claims 1-7 will be pending in the application.

The specification has been amended to add a "Cross-Reference to Related Applications" section and to correct various obvious typographical errors. Accordingly, no new matter has been added by these amendments.

The text and drawing of Fig. 1 has been formalized, and numbers which are not described in the specification have been removed. Accordingly, no new matter has been added by these amendments.

Applicants note on the initialed copy of the PTO Form 1449 attached to the Office Action mailed May 22, 2003 there was one reference that was not initialed. Applicants respectfully request that the Examiner initial that this reference has been considered and will appear on the front of any patent issuing from this application.

The Office Action states on page 2 that this application appears to claim subject matter disclosed in prior application number 60/233,401, filed September 18, 2000, and that a reference to the prior application must be inserted as the first sentence of the specification of this application or in an application data sheet if Applicant intends to

rely on the filing date of the prior application under 35 U.S.C. §§ 119(e) or 120. Applicants respectfully submit that a reference to this prior application was contained in the Application Data Sheet filed with the application. Furthermore, Applicants have also herein amended the specification to add a first sentence describing the priority claim for this application. Accordingly, Applicants respectfully request that this objection be reconsidered and withdrawn.

The outstanding rejections are addressed individually below.

1. *Claim 6, as amended, is not anticipated by Doillon et al.*

Claim 6 stands rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Doillon *et al.* Applicants respectfully traverse this rejection.

Applicants respectfully submit that Doillon *et al.* does not teach a connective tissue construct of the present invention. Accordingly, the cited reference does not teach all of the limitations of the claim.

The specification states at page 2, lines 20-22 that “[t]he cultured connective tissue construct is a living cultured tissue containing connective tissue cells and extracellular matrix, such as collagen.”

Doillon *et al.* does not teach the presence of connective tissue cells in the implanted sponges of the patent. Doillon *et al.* generally relates to “a biomaterial of a stable porosity which comprises a porous biopolymer matrix into which is conjugated a polyethylene molecule . . .” (Col. 3, lines 28-30) Doillon *et al.* discusses that the materials described in the patent allow for “colonization of the cells participating in the reconstruction . . .” (Col. 6, lines 41-42) Although Doillon *et al.* does discuss culturing fibroblasts with the described material, these cultures are for purposes of experiments (to determine cell infiltration (abstract), to determine cell growth (Col. 11, line 25), for SEM observation (Col. 11, line 26), and to determine cell shape, cell-cell interactions and cytotoxicity (Col. 15, line 40 to Col. 16, line 2)). Doillon *et al.* does not indicate that the implanted sponges or materials contained fibroblasts. (Col. 11, lines 66-67 and Col. 16, line 4). Furthermore, Doillon *et al.* discusses the cell infiltration by fibroblasts and tissue

ingrowth of some of these collagen sponges. (Col. 16, lines 7-48 & Col. 12, lines 25-29) However, Doillon *et al.* does not disclose using the biomaterial with the cultured fibroblasts as a construct for implantation into a subject. Therefore, Doillon *et al.* does not teach or describe a connective tissue construct comprised of living cultured tissue containing connective tissue cells and extracellular matrix for implantation into a subject.

Furthermore, Doillon *et al.* does not disclose using the biomaterial disclosed therein for repair of an intervertebral disc.

Thus, Doillon *et al.* does not teach or suggest all of the claim limitations.

Accordingly, Applicants submit that this rejection has been overcome. Applicants respectfully request that this rejection under 35 U.S.C. § 102(b) be reconsidered and withdrawn.

**2. *Claims 1-5 are not obvious over Stovall in view of Doillon et al.***

Claims 1-5 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Stovall in view of Doillon *et al.* Applicants respectfully traverse this rejection.

M.P.E.P. § 2142 states:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.

While Applicants do not necessarily agree that Stovall teaches all of the features for which it is cited, Applicants note that the Office Action admits that Stovall lacks the

teaching of the cultured connective tissue construct. Applicants respectfully submit that Doillon *et al.* does not teach a connective tissue construct of the present invention. Accordingly, the cited references do not teach all of the limitations of the claims.

The specification states at page 2, lines 20-22 that “[t]he cultured connective tissue construct is a living cultured tissue containing connective tissue cells and extracellular matrix, such as collagen.”

Doillon *et al.* does not teach the presence of connective tissue cells in the implanted sponges of the patent. Doillon *et al.* generally relates to “a biomaterial of a stable porosity which comprises a porous biopolymer matrix into which is conjugated a polyethylene molecule . . . .” (Col. 3, lines 28-30) Doillon *et al.* discusses that the materials described in the patent allow for “colonization of the cells participating in the reconstruction . . . .” (Col. 6, lines 41-42) Although Doillon *et al.* does discuss culturing fibroblasts with the described material, these cultures are for purposes of experiments (to determine cell infiltration (abstract), to determine cell growth (Col. 11, line 25), for SEM observation (Col. 11, line 26), and to determine cell shape, cell-cell interactions and cytotoxicity (Col. 15, line 40 to Col. 16, line 2)). Doillon *et al.* does not indicate that the implanted sponges or materials contained fibroblasts. (Col. 11, lines 66-67 and Col. 16, line 4). Furthermore, Doillon *et al.* discusses the cell infiltration by fibroblasts and tissue ingrowth of some of these collagen sponges. (Col. 16, lines 7-48 & Col. 12, lines 25-29) However, Doillon *et al.* does not disclose using the biomaterial with the cultured fibroblasts as a construct for implantation into a subject. Therefore, Doillon *et al.* does not teach or describe a connective tissue construct comprised of living cultured tissue containing connective tissue cells and extracellular matrix for implantation into a subject.

Thus, the cited references do not teach or suggest all of the claim limitations.

Furthermore, given that Doillon *et al.* does not disclose using biomaterial with cultured fibroblasts as a construct for implantation into a subject and does not disclose using the biomaterial disclosed therein for repair of an intervertebral disc, one of skill in

the art would not have been motivated to combine Doillon *et al.* with Stovall. Furthermore, since Doillon *et al.* did not disclose using biomaterial with cultured fibroblasts as a construct for implantation into a subject, one of skill in the art would not have had a reasonable expectation of success that the biomaterial of Doillon *et al.* with the addition of cultured fibroblasts would work with the method for repairing intervertebral discs of Stovall.

Accordingly, Applicants respectfully submit that the claimed invention is not unpatentable under 35 U.S.C. § 103(a) over Stovall in view of Doillon *et al.* Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

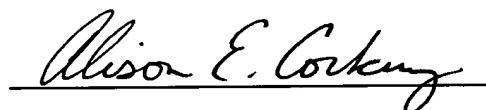
CONCLUSIONS

In view of the arguments set forth above, Applicants respectfully submit that the rejections contained in the Office Action mailed on May 22, 2003, have been overcome, and that the claims are in condition for allowance. If the Examiner believes that any further discussion of this communication would be helpful, he is invited to contact the undersigned at the telephone number provided below.

Applicants enclose herewith a petition for a two month extension of time pursuant to 37 C.F.R. § 1.136, up to and including October 22, 2003, to respond to the Examiner's Office Action mailed on August 22, 2003. Please charge deposit account no. 08-0219 the \$210.00 fee for this purpose.

No other fees are believed to be due in connection with this response. However, please charge any underpayments or credit any overpayments to Deposit Account No. 08-0219.

Respectfully submitted,



Alison E. Corkery  
Reg. No. 52,770

**Date: October 22, 2003**  
HALE AND DORR LLP  
60 State Street  
Boston, MA 02109  
Tel: (617) 526-6000  
Fax: (617) 526-5000